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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/006,612	11/30/2001	Sammy Haddad	20.2787	1146

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EXAMINER	
JAGAN, MIRELLYS	
ART UNIT	**PAPER NUMBER**
2859	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	**Application No.** 10/006,612	**Applicant(s)** HADDAD ET AL.	
	Examiner Mirellys Jagan	**Art Unit** 2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11/10/03*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 March 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *6/23/03*.

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other:

&10/15/03

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statements filed 6/23/03 and 10/15/03 have been considered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 3,913,398 to Curtis in view of U.S. Patent 5,321,612 to Stewart.

Curtis discloses a method of calculating a static formation temperature in a reservoir penetrated by a wellbore, the method comprising the steps of:

inserting a sink probe within the wellbore using a wireline/tubular string;

estimating the static formation temperature (DG);

calculating a formation fluid temperature (DE) at the wellbore and developing a calculated formation fluid temperature versus time profile, wherein the calculation is partly based on the estimated static formation temperature;

measuring the temperature of a sample of formation fluid at the wellbore and developing a measured formation fluid temperature versus time profile;

comparing the calculated formation fluid temperature at the wellbore with the measured temperature of the formation fluid; and

predicting the static formation temperature by altering the estimate of the formation fluid temperature until an error between the calculated formation fluid temperature at the wellbore and the measured formation fluid temperature is minimized,

wherein the calculation of formation fluid temperature at the wellbore comprises solving radial heat flux equations (see figure 5; column 11, lines 57-68; column 25, lines 15-22; column 14, lines 11-22; column 26, lines 46-68; and column 30, lines 12-17).

Curtis does not disclose calculating the formation fluid temperature by developing a three-dimensional fluid flow model through the reservoir using an estimated formation fluid withdrawal rate at the wellbore, solving radial heat flux equations in conjunction with the three-dimensional flow model to develop the calculated formation fluid temperature versus time profile, quantifying an error between the measured formation fluid temperature versus time profile and the calculated formation fluid temperature versus time profile, and predicting the formation temperature by minimizing the error between the profiles.

Stewart teaches the use of radial heat flux equations in conjunction with a three-dimensional fluid flow model to develop a calculated formation fluid temperature at a volume of a reservoir versus time profile, wherein the model also takes into account the withdrawal rate. A temperature measurement is performed of a sample of formation fluid temperature at a given location and a measured formation fluid temperature versus time profile is developed, and an error between the measured formation fluid temperature versus time profile and the calculated formation fluid temperature versus time profile is quantified. The error is minimized between the

profiles (see abstract; column 4, lines 42-68; column 5, lines 3-40; column 6, lines 23-49; column 7, lines 1-24; column 19, lines 8-51; and column 21, line 43-column 24, line 68).

Referring to claim 1, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method disclosed by Curtis by calculating the formation fluid temperature by developing a three-dimensional fluid flow model using an estimated formation fluid withdrawal rate, and solving radial heat flux equations in conjunction with the three-dimensional flow model to develop the calculated and measured formation fluid temperature versus time profiles to quantify an error between profiles, as taught by Stewart, in order to create a more accurate model and obtain a more accurate prediction of the formation temperature.

4. Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Curtis and Stewart, as applied to claims 1-8 above, and further in view of U.S. Patent 4,370,886 to Smith, Jr. et al [hereinafter Smith].

Curtis and Stewart disclose a method having all of the limitations of claims 9-11, as stated above in paragraph 3, except for the sink probe engaging the well bore wall and removing a sample of formation fluid from the formation at a substantially known withdrawal rate to measure its temperature.

Smith teaches that it is known in the art of testing formation fluid to insert a sink probe within the wellbore and engage the formation to remove a sample of formation fluid to measure the temperature of the fluid, and purge the tested sample into the wellbore. The sample is

withdrawn and purged by using controlled valves (hence the withdrawal rate is substantially known in order to control the valve).

Referring to claim 9, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method disclosed by Curtis and Stewart by replacing the sink probe with a sink probe as taught by Smith, in order to directly contact the formation fluid from the source and obtain a more accurate temperature measurement of the formation fluid.

5. Claims 12-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Curtis in view of Stewart and Smith.

Curtis discloses a method of calculating a static formation temperature in a reservoir penetrated by a wellbore, the method comprising the steps of:

inserting a sink probe within a producing wellbore using a wireline/tubular string (a producing wellbore does not have wellbore fluid circulating within, i.e., mud or other contaminating fluids, since the movement of formation fluid flowing out of a producing wellbore purges the mud and contaminants from the wellbore);

estimating the static formation temperature (DG);

calculating a formation fluid temperature (DE) at the wellbore and developing a calculated formation fluid temperature versus time profile, wherein the calculation is partly based on the estimated static formation temperature;

measuring the temperature of a sample of formation fluid at the wellbore and developing a measured formation fluid temperature versus time profile;

comparing the calculated formation fluid temperature at the wellbore with the measured temperature of the formation fluid; and

predicting the static formation temperature by altering the estimate of the formation fluid temperature until an error between the calculated formation fluid temperature at the wellbore and the measured formation fluid temperature is minimized,

wherein the calculation of formation fluid temperature at the wellbore comprises solving radial heat flux equations (see figure 5; column 11, lines 57-68; column 25, lines 15-22; column 14, lines 11-22; column 26, lines 46-68; and column 30, lines 12-17).

Curtis does not disclose the sink probe engaging the well bore wall and removing a sample of formation fluid from the formation at a substantially known withdrawal rate to measure its temperature, comparing the profiles, and predicting the formation temperature by altering the estimate of the formation fluid temperature until an error between the profiles is minimized.

Stewart teaches the use of radial heat flux equations in conjunction with a three-dimensional fluid flow model to develop a calculated formation fluid temperature at a volume of a reservoir versus time profile, wherein the model also takes into account the withdrawal rate. A temperature measurement is performed of a sample of formation fluid temperature at a given location and a measured formation fluid temperature versus time profile is developed, and an error between the measured formation fluid temperature versus time profile and the calculated formation fluid temperature versus time profile is quantified. The error is minimized between the profiles (see abstract; column 4, lines 42-68; column 5, lines 3-40; column 6, lines 23-49; column 7, lines 1-24; column 19, lines 8-51; and column 21, line 43-column 24, line 68).

Smith teaches that it is known in the art of testing formation fluid to insert a sink probe within the wellbore and engage the formation to remove a sample of formation fluid to measure the temperature of the fluid, and purge the tested sample into the wellbore. The sample is withdrawn and purged by using controlled valves (hence the withdrawal rate is substantially known in order to control the valve).

Referring to claims 12 and 17, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method disclosed by Curtis by calculating the formation fluid temperature by developing a three-dimensional fluid flow model using an estimated formation fluid withdrawal rate, and solving radial heat flux equations in conjunction with the three-dimensional flow model to develop the calculated and measured formation fluid temperature versus time profiles to quantify an error between profiles, as taught by Stewart, in order to create a more accurate model and obtain a more accurate prediction of the formation temperature.

Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method disclosed by Curtis by replacing the sink probe with a sink probe as taught by Smith, in order to directly contact the formation fluid from the source and obtain a more accurate temperature measurement of the formation fluid.

Further referring to claim 17, is following the method disclosed by Curtis, Stewart, and Smith, the method steps of claims 17-21 will also be followed.

Response to Arguments

6. Applicant's arguments filed 11/24/03 have been fully considered but they are not persuasive.

Applicant's arguments that Curtis measures the temperature of a fluid, e.g., mud, instead of a fluid from the formation, i.e., formation fluid, are not persuasive since Curtis measures the temperature of the formation fluid in a producing well. Therefore, the borehole in the Curtis reference does not have mud or other contaminating fluids since the movement of formation fluid flowing out of the borehole purges the mud and contaminants from the borehole.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mirellys Jagan whose telephone number is 703-305-0930. The examiner can normally be reached on Monday-Thursday from 8AM to 4PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on 703-308-3875. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

mj
January 22, 2003

Diego Gutierrez
Supervisory Patent Examiner
Technology Center 2800

CHRISTOPHER W. FULTON
PRIMARY EXAMINER